

## **Reaction Time Experiment - Sheenin (6A)**

### **Aim:**

How does the increase of time for each trial that is given to participants to adapt to the anticipation of the drop of the ruler affect their reaction time? (Sheenin)

*Example: How does the amount of time given for participants to adapt to a reaction task affect their reaction time? (-Michael N.) => Format >How does, 'independent variable' affect 'dependent variable'.*

### **Background:**

Reaction task - A meter rule is dropped and participants have to catch the ruler. (Michael N.)

Reaction time - measured by the length of ruler when caught by participants. The shorter the length, the faster the reaction time

### **Hypothesis:**

The more time that each participant have to adapt to the anticipation of the drop of the ruler, the shorter their reaction time.

*Example: The more time given for participants to adapt to the reaction task, the shorter their reaction time. (-Michael N.)*

### **Scientific understanding:**

The participants' senses and anticipation will become sharper throughout the experiment because they are more familiar to the task. The senses that will be particularly used in this experiment are vision and touch. Vision sense will be used because we need to look at our hand and grab the ruler immediately after we see it passing through our hand. The sense of touch will be used because, when the participant catches the ruler, he/she is touching the ruler and therefore should not move their hand anymore. The participants can anticipate the drop by many ways, such as listening carefully to the sound of the ruler being released.

*Example: Senses become sharper as the participants become more familiar to the task, particularly hearing and vision senses. Participants may begin to observe the drop, by body language and anticipate the moment of drop. (-Michael N.)*

*Our brains' wiring become more efficient and better networked when they focus on a task. Pathway between neurons are changed or adapted so that signals can flow better so that the brain coordinates with muscles more quickly. Therefore the reaction time would be shorter.*

### **Independent variable:**

Each time when the ruler is drop, participants have about 10 more seconds to adapt to the reaction task. Since the ruler will be dropped six times, participants would have about one minute to adapt at the sixth trial.

### **Dependent variable:**

The ruler was being dropped for six times. Each time the ruler was dropped, the participant

must catch the ruler as fast as possible. Each record is taken after each of the six trials. The mark that is right above our hand is the measurement which we will record, and round off to the nearest whole number. After the sixth trial, the sum, average, minimum, maximum and count of each participant's measurements were calculated in a table. The collected information will be recorded in a table, similar to the one shown below:

Name	Trial 1/cm	Trial 2/cm	Trial 3/cm	Trial 4/cm	Trial 5/cm	Trial 6/cm	Sum	Aver.	Min.	Max.	Count
Thomas											
Tyler											
Elzando											
Jack											
Shishir											
Eojin											
Mami											
Sheenin											
Seungmin											
Lara											

*Example: In this experiment the reaction time of each participant was measured by finding out how many centimeters went through their hand before the hand grabbed it. Once we found out the amount of centimeters that went through the hand we could work out each person's average reaction time. (-Jack)*

**Controlled variable:**

- The palm of the hand which is catching the ruler must be straight and placed right below the zero-point of the metre ruler.
- The ruler must be dropped from the same height.  
The dropper's hand must be drop from their shoulder length.
- The ruler must be dropped by the same person.
- The ruler must be dropped in the same way throughout the six trials.
- The person who is catching the ruler needs to look at his/her own hand, not the hand of the dropper.
- Use the same ruler throughout the whole experiment for all participant.

### **Evaluation:**

In this experiment, I learnt that everyone adapts to the new environment in various speed. Some people can adapt very quickly, therefore, big improvements can be seen in their results. However, some people adapt slower, so their results will not have a significant improvement.

I have learnt how to make graphs using Numbers, as well as how to use the different functions(Sum, Average, Minimum etc.) of Numbers. These skills will be extremely useful to me because I often need to create tables and graphs. The “functions” tool will save me a lot of time by doing all of the calculations for me instead of manually calculating them.

I would improve on making my experiment more accurate by emphasizing the control variables. I did not make sure that the ruler was being dropped from the same height and it was not dropped by the same person throughout my six trials. Also, every participant had a different type of ruler which will affect their results. Below are some example of actions that can be taken to improve the accuracy of the results from this experiment, along with a reason.

- We could use a retort stand or clamp to hold and drop the ruler from a flat area so that the ruler will be dropped at the same height. This will have a more accurate result because the distance of the drop of the ruler will be approximately equal in all of the trials.
- We should use a string to hold the ruler instead of using the hands so that the ruler will be dropped straight down, not diagonally down. This will have a more accurate result because the participant’s hands will not need to move around to catch the ruler which will affect the result.
- The experiment should have more than six trials in order to get a more accurate result. This will have a more accurate and reliable result because there will be a significant change of adaptation from the first trial to the last trial.
- The dimensions on the ruler that we used should be more accurate. We can use ruler that are electrical. Therefore, when the dimensions are touch, the computer will automatically sensor the exact location of our hands. This will have a more accurate result because the measurement will not need to be rounded off too much.
- We should use the same ruler throughout the experiment. Since that we used different types of ruler for each participant, it strongly affected the results. A few of the rulers had splinters on the bottom of the ruler. This will affect the results because the participants will not wish to be cut by the splinters. Therefore, they will wait till the part which has splinters to pass through before they catch the ruler.